## **PCT**





### INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6:

G01N 21/64 // G02B 21/00

A1

(11) International Publication Number:

WO 98/11425

(43) International Publication Date:

19 March 1998 (19.03.98)

(21) International Application Number:

PCT/GB97/02388

(22) International Filing Date:

5 September 1997 (05.09.97)

(30) Priority Data:

9618897.4

10 September 1996 (10.09.96) GB

(71) Applicant (for all designated States except US): BIO-RAD MICROMEASUREMENTS LIMITED [GB/GB]; Bio-Rad House, Maylands Avenue, Hemel Hempstead, Hertfordshire HP2 7TD (GB).

(72) Inventors; and

- (75) Inventors/Applicants (for US only): MAYES, lan, Christopher [GB/GB]; Bio-Rad House, Maylands Avenue, Hemel Hempstead, Hertfordshire HP2 7TD (GB). HIGGS, Victor [GB/GB]; Bio-Rad House, Maylands Avenue, Hemel Hempstead, Hertfordshire HP2 7TD (GB).
- (74) Agent: WILLIAM JONES (YORK); The Crescent, 54 Blossom Street, York YO2 2AP (GB).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

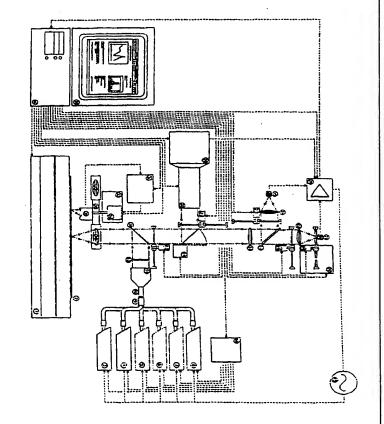
#### **Published**

With international search report.

(54) Title: APPARATUS AND METHOD FOR DETECTING MICRO DEFECTS IN SEMI-CONDUCTORS

#### (57) Abstract

The invention relates to a method and apparatus for detecting defects in a semiconductor or silicon structure at room temperature, and in an efficient time, using photoluminescence. The invention employs the use of a high intensity beam of light preferably having a spot size between 0,1 mm-0,5 microns and a peak or average power density of  $10^4$ - $10^9$  w/cm² with a view to generating a high concentration of charge carriers, which charge characters detect defects in a semiconductor by interacting with same. These defects are visible by producing a photoluminescence image of the semiconductor. Several wavelenghts may be selected to identify defects at a selective depth as well as confocal optics may be used.



# FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AM	Annenia	FR	France	LU	Luxembourg	SN	Senegal
AT		GA	Gabon	LV	Latvia	SZ	Swaziland
AU	Australia	GB	United Kingdom	MC	Monaco	TD	Chad
AZ	Azerbaijan	GE	Georgia	MD	Republic of Moldova	TG	Togo
BA	Bosnia and Herzegovina	GH	Ghana	MG	Madagascar	ТJ	Tajikistan
BB	Barbados	GN	Guinea	MK	The former Yugoslav	TM	Turkmenistan
BE	Belgium		Greece	1414	Republic of Macedonia	TR	Turkey
BF	Burkina Faso	GR		ML	Mali	TT	Trinidad and Tobago
BG	Bulgaria	HU	Hungary	MN	Mongolia	UA	Ukraine
BJ	Benin	ΙE	Ireland	MR	Mauritania	UG	Uganda
BR	Brazil	IL	Israel		Malawi	US	United States of America
BY	Belarus	IS	Iceland	MW		UZ	Uzbekistan
CA	Canada	IT	Italy	MX	Mexico	VN	Viet Nam
CF	Central African Republic	JР	Japan	NE	Niger		
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
СН	Switzerland	KG	Kyrgyzstan	NO	Norway	zw	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
cz	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		
""		•					
i							